SECTION 7

Front Axle

INDEX

7A STRAIGHT FRONT AXLE

Part A

7A STRAIGHT FRONT AXLE

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7A.1 SPECIFICATION

Type	:	Three piece telescopic straight front axle with adjustable tracks.

Track settings:

For 2605 2WD:

Number of setting rear wheel	:	6
Minimum	:	52.8 inch (1341 mm)
Maximum	:	72.8 inch (1849 mm)

For 2615 2WD:

Number of setting rear wheel	:	6
Minimum	:	53.6 inch (1361 mm)
Maximum	:	73.6 inch (1869 mm)

Increments (Adjustabe in steps of)	:	4 inch (102 mm)
Front wheel Toe-in	:	0.039 - 0.196 inch (1 to 5 mm)
Camber angle	:	3°30’
Castor angle	:	4°56’
Axle centre beam to support front casting clearance	:	0.002 inch - 0.010 inch (0.05-0.25 mm)
Arm spindle to arm assembly clearance	:	0 – 0.002 inch (0 – 0.05 mm)

Special Tools :

SER / 054	:	Tractor splitting stand
SER / 015	:	Front axle spindle bush remover – Main tool
SER / 016	:	Adapter
SER / 013	:	Spindle bush reamer
SER / 045	:	Pusher
SER / 014	:	Inner bearing cup replacer
SER / 012	:	Outer bearing cup replacer
SER / 147	:	Hub oil seal replacer
SER / 082	:	Front wheel hub remover
SER / S / 230	:	Pin Pivot remover

Torque value

Tie rod assembly clamp bolt and nut	:	37 lbf. ft. (50 Nm)
Front hub, nut hex castle	:	59 lbf. ft. (80 Nm)
Steering arm nut	:	107 lbf. ft. (145 Nm)
Tie rod bolts	:	37 lbf. ft. (50 Nm)
Centre beam to front axle bolts	:	151 lbf. ft (205 Nm)
Front support bolts	:	205 lbf. ft (280 Nm)

General Description

The front axle assembly consists of an axle beam and two arm assembly. The centre beam is attached to a pivot pin which pivots in the front support casting. The arm assembly can be bolted to the centre beam in alternative positions to provide front wheel track adjustments.

Fig. 1 shows the general arrangement of the front axle assy.

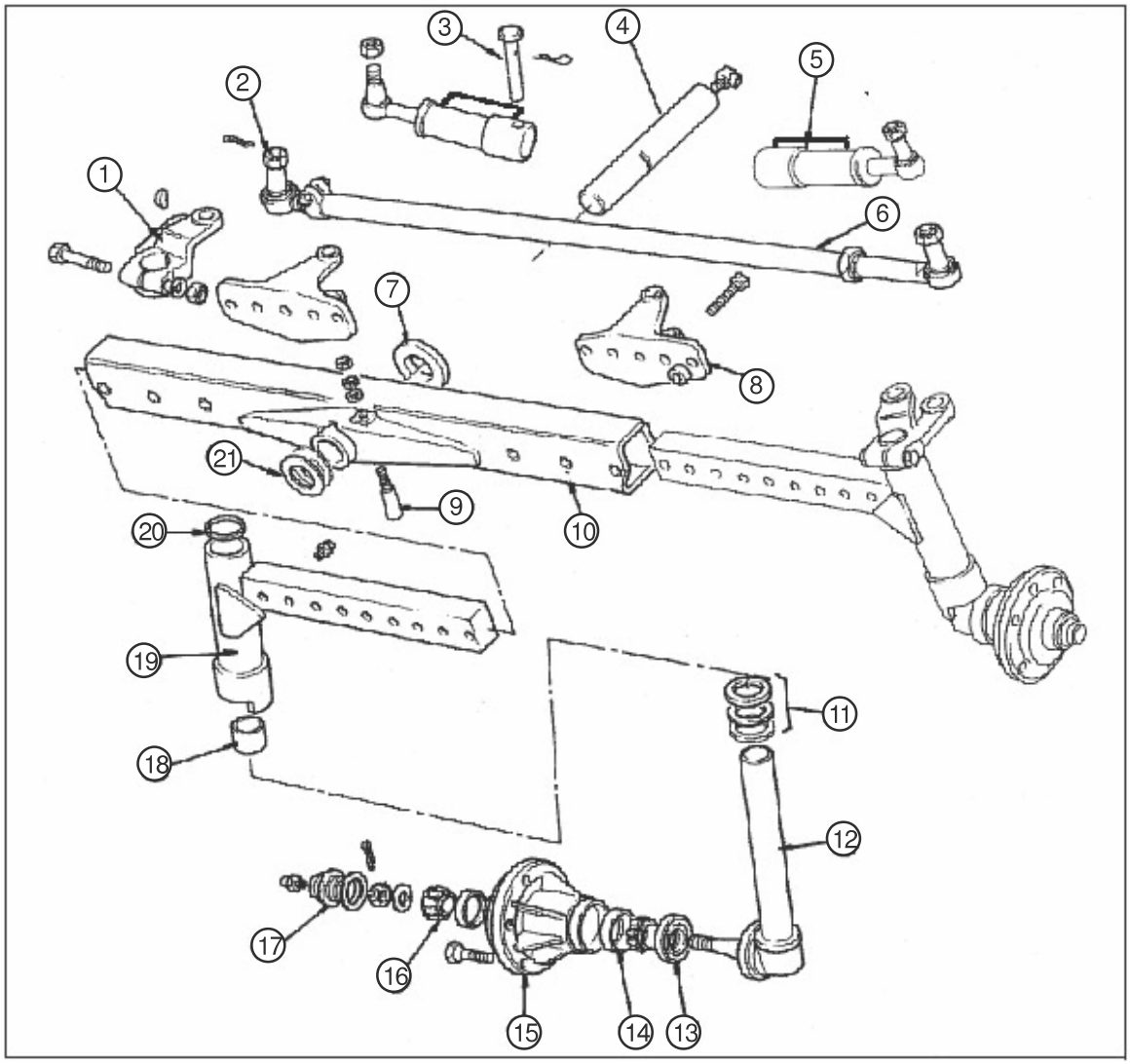

Fig 1

1. Steering arm.
2. Ball joint.
3. Steering ram pivot pin.
4. Pivot pin.
5. Steering cylinder.
6. Tie rod.
7. Thrust washer.
8. Steering ram bracket.
9. Pin.
10. Centre beam.
11. Thrust bearing and spacer
12. Spindle.
13. Seal.
14. Taper roller bearing (Inner)
15. Hub.
16. Taper roller bearing (outer).
17. Hub. cap.
18. Bush.
19. Front axle arm.
20. Seal.
21. Shims.

7A.2 FRONT WHEEL TOE-IN ADJUSTMENT

Procedure

1. The tractor must be on firm level ground with the wheels facing straight ahead position.
2. To check the toe-in, see illustrations given in Fig. 2. Distance A must be 0.039 - 0.196 inch (1– 5 mm), greater than the distance B, measured on the center line of the axle at the wheel rim.

If adjustment is required

1. Loosen the tie-rod assy. clamp bolt and nut (Item 1 in Fig.3).
2. Slacken the track adjusting set screw and nut (Item 2 in Fig.3).
3. Screw out the tie-rod tube to increase toe-in. Screw in the tie-rod tube to decrease toe-in.
4. Re-tighten the clamp nut and bolt to a torque of 37 lbf. ft. (50 Nm) and tighten the lock nut.

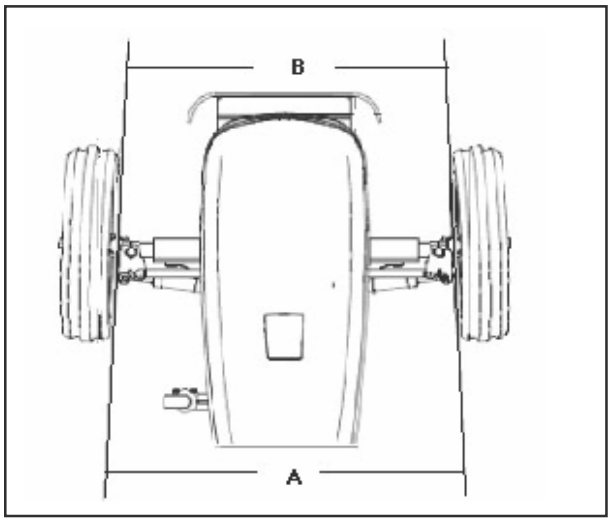

Fig. 2

7A.3 FRONT HUB OVER HAUL

Dis-assembly

1. Apply the tractor parking brake and fit wheel chocks to hold the rear wheels.
2. Raise the front of the tractor.
3. Remove the front wheel.
4. Remove the hub cap and gasket (Item 1 in Fig.4).
5. Remove and discard the cotter pin (Item 2 in Fig.4).
6. Remove the nut hex castle and washer (Item 3 in Fig.4).
7. Remove the hub assy. complete with bearing and seal from the spindle assy. (Item 4 in Fig.4).
8. Remove the outer bearing cone (Item 5 in Fig.4).
9. Tap out the outer bearing cup (Item 6 in Fig.4).
10. Remove the seal (Item 7 in Fig.4).
11. Drive out the inner bearing cone (Item 8 in Fig.4).
12. Drive out the inner bearing cup (Item 9 in Fig.4).

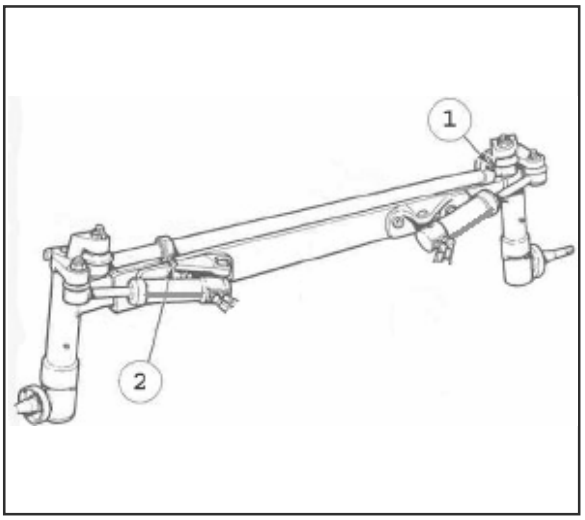

Fig. 3

Examination :

Completely clean the hub components and check the condition of the hub, spindle and bearings. Any worn or damaged components should be replaced.

Re-assembly

For re-assembling, follow the reverse procedure given above, and

1. Pack the bearings with approved grease.

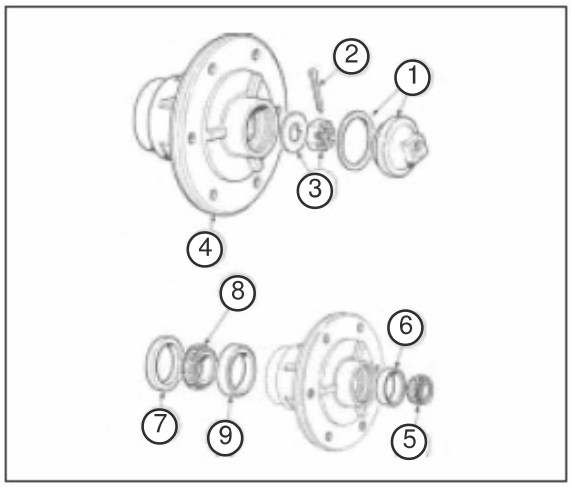

Fig 4

2. Always fit a new seal with the lip facing outward and fit the seal right into the recess of the hub.
3. Tighten the castle nut to 59 lbf. ft. (80 Nm) and then slacken off the nut to the nearest cotter pin hole to give the correct end float.
4. Re-fit the cap front wheel hub with new gasket.
5. Grease the hub through the grease nipple on the cap front hub, until grease comes out from the seal at the back of the hub.

7A.4 FRONT AXLE SPINDLE

REMOVAL AND RE-FITMENT

Removal sequence

1. Remove the hub.
2. Remove the cotter pin and nut and then detach the tie-rod assy (Item 3 in Fig. 5).
3. Detach the steering cylinder from steering arm (Item 2 in Fig. 5).
4. Remove the arm spindle bolt and nut and arm spindle (Item 3 in Fig. 5).
5. Remove the key-wood ruff (Item 4 in Fig. 5).
6. Remove the seat spindle arm dust (Item 5 in Fig. 5).
7. Lower the front axle spindle from the arm assy.
8. Remove the thrust washer and spacer from the spindle (Item 6 in Fig. 5).

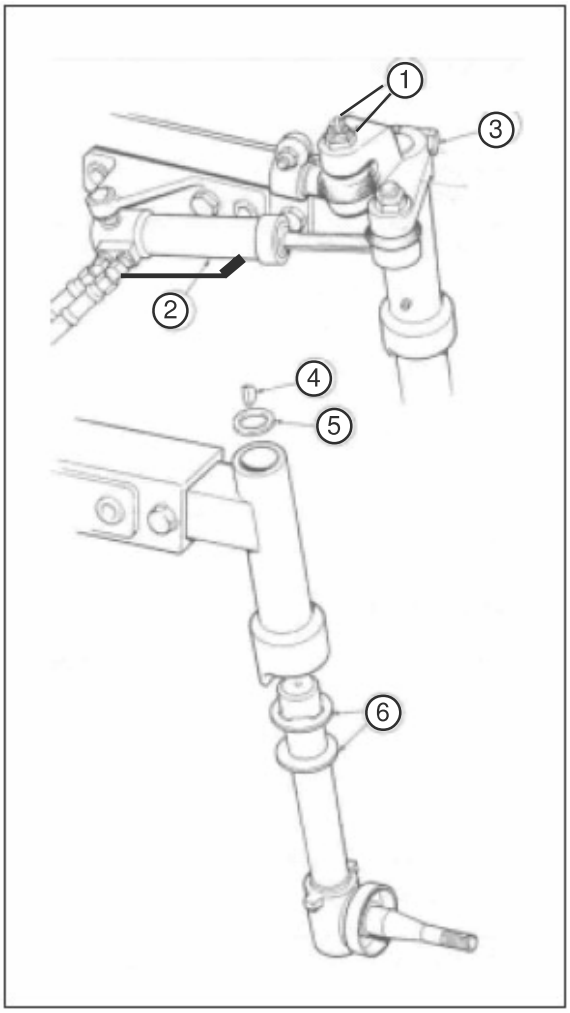

Fig 5

Examination:

Examine the spindle thrust washer for wear or damage and replace, if necessary.

Re-fitment

For re-fitment, follow the reverse procedure above,

1. Renew the spindle arm dust seal.
2. Lubricate the thrust washer with an approved grease before re-fitting.
3. Fit the spacer to the spindle shaft followed by the thrust washer with indentations in the brass face facing downwards in contact with the spacer.
4. Refit the steering arm with bolt and nut on the inside.

5. Tighten the steering arm nut to a torque of 107 lbf. ft (145 Nm)
6. Check the gap between the steering arm and arm assembly. The gap should be 0.0019 inch (0.05 mm) max.
7. Grease the spindle bearings with the wheels off the ground until the grease comes out at the top and bottom of the arm assembly.

7A.5 FRONT AXLE ARM ASSEMBLY

Removal and re-fitment

Removal sequence

1. Remove the front axle spindle with hub.
2. Remove the three nuts and bolts (Item 1 in Fig. 6).
3. Slide out the arm assembly from the centre beam. (Item 2 in Fig. 6).

Re-fitment

For re-fitment, follow the reverse procedure given above, and

1. Tighten the center beam to front axle arm assembly bolts to a torque of 151 lbf. ft. (205 Nm) with wheels on the ground.

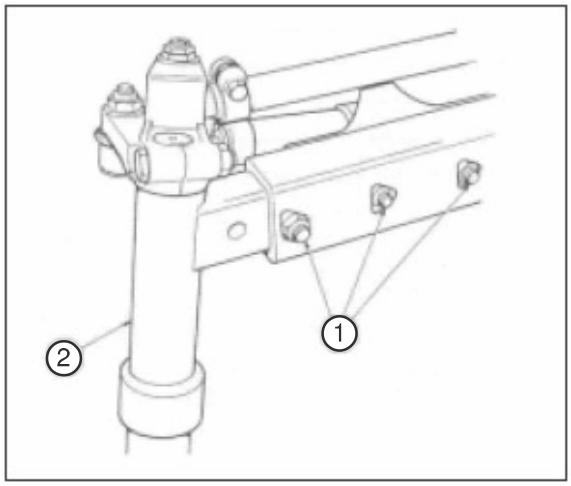

Fig 6

Overhaul

Special Tools

SER / 015	:	Front Axle Spindle Bush Remover – Main tool
SER / 016	:	Adapter
SER/045	:	Pusher
SER / 013	:	Spindle Bush Reamer

Dis-assembly

1. Remove the front axle arm assembly.
2. Secure the arm assembly in a vice (Fig. 7).
3. Use SER / 015 and SER / 016 to remove the bush by screwing the threaded extractor into the bush with the upper handle. Withdraw the bush by turning the lower handle.
4. Invert the front axle arm assembly and remove the other bush as explained above.

Re-assembly

1. Place the new bush on the front axle (Fig. 8) centrally locate the tool SER/045 on the bush and drive home the bush. Repeat the process for the bottom bush by using the tool from bottom side.

   Note: *Clean the bush seating portion thoroughly before fitment.*

2. Insert the reamer (SER / 013) through the bush as shown in the Fig. 9.

   Centrally locate the tool onto the top portion of the spindle bush and rotate it till the tool completes the travel up to the bottom portion of the top bush.

   After reaming the top bush, guide the tool further, so that the cutter gets located on the bottom bush.

   Rotate the tool in clock wise direction and take out the tool after reaming the bottom bush.

   Note : *Rotate the tool in clock wise direction only.*

   Before assembling the spindle, on the front axle, clean the metal burrs from the top and bottom bush and ensure the grease nipple holes are clear.

3. Refit the spindle shaft assembly.

   Note: *Ensure all parts are suitably greased before re-assembly.*

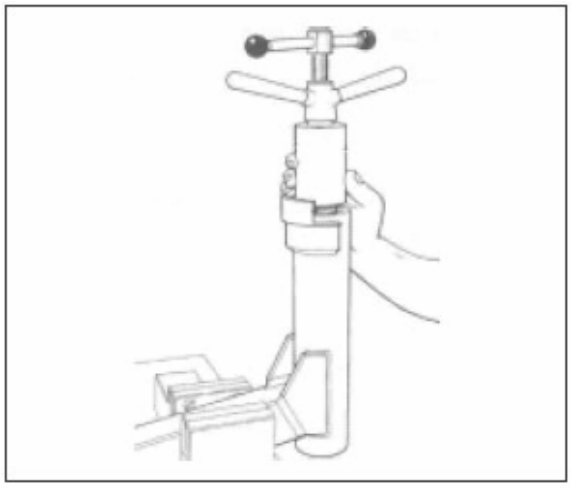

Fig 7

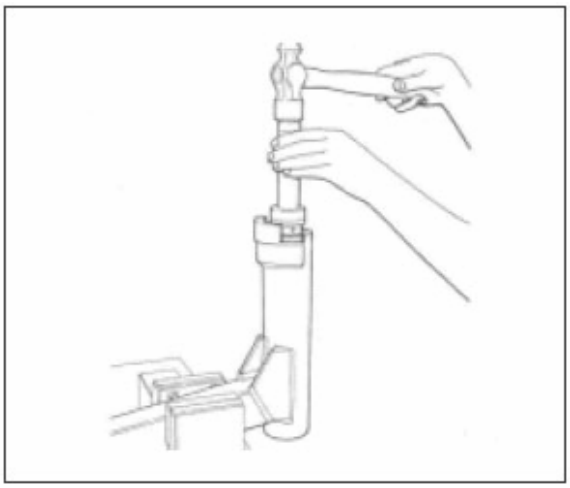

Fig 8

7A.6 CENTER BEAM

Removal and re-fitment

Special Tools

SER / 054 : Tractor splitting stand

SER / S / 230 : Pivot pin remover.

Removal sequence

1. Apply the tractor parking brake and fit wheel chocks to hold the rear wheels.
2. Remove the front weight frame and weights, if fitted.
3. Disconnect the headlight wire connections and remove the one piece hood or bonnect assembly.
4. Drain radiator coolant and remove the top and bottom hoses.
5. Remove the radiator assembly.
6. Remove the fan blade.
7. Raise the tractor at the front.
8. Support the tractor under the engine sump.
9. Disconnect and plug the hydrostatic steering cylinder hoses (Item 1 in Fig. 10)

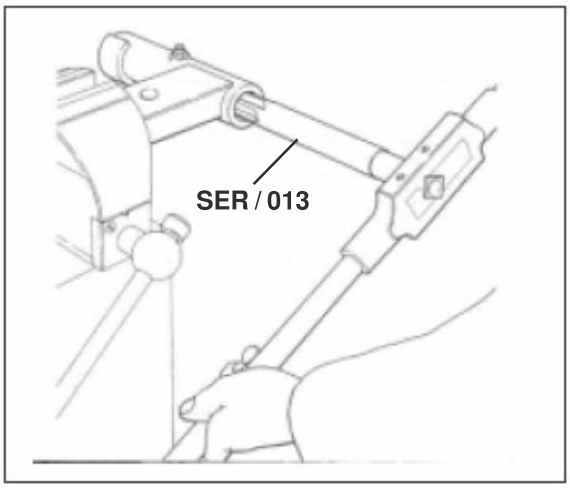

Fig 9

10. Remove steering cylinders clevis pin on both sides (Item 2 in Fig. 10)
11. Remove the tie rod assembly (Item 3 in Fig. 11)
12. Remove three nuts and bolts from each end of the center beam (Item 4 in Fig. 11)
13. Slide out both the front axle arm assemblies complete with wheel and steering cylinder. (Item 5 in Fig. 11)
14. Disconnect the remote grease hoses.
15. Push the center beam back on its pivot pin against the thrust washer. Using feeler gauges, check the gap between the front boss and the beam and the front support casting. If it exceeds 0.0098 inch (0.25 mm), note the dimension. (Fig.12)
16. Remove the pin (item 5 in fig 10) and hair pin internal (item 4 in fig 10).
17. With the centre front axle beam supported on both sides using SER / S / 230 and the 7/16" UNC adapter, remove the pivot pin from the casting.
18. Lift and remove the center beam, thrust washer and shims out from the tractor.

Examination

Check the end face of the center beam of the boss, the pivot pin and the thrust washer for wear. Examine all surfaces for wear or damages

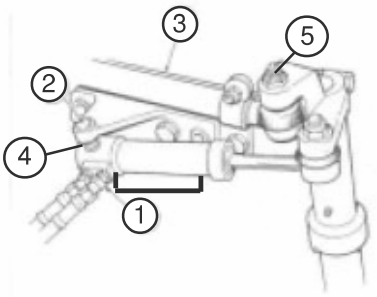

Fig 10

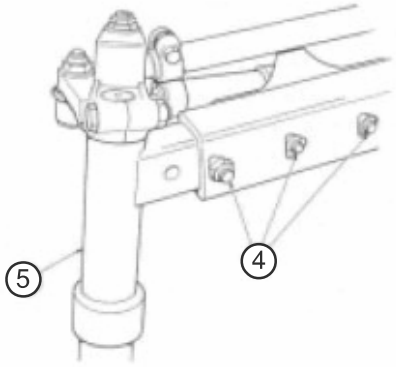

Fig. 11

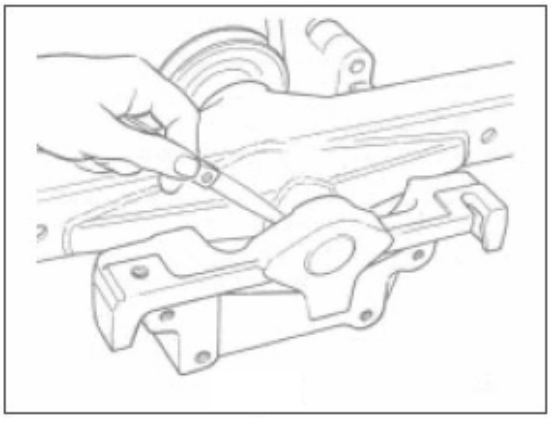

Fig 12

Re-fitment

For re-fitment, follow the reverse procedure above

1. If gap between center beam and support casting exceeds 0.0098 inch (0.25mm) suitable shims to be added in between the center beam and support casting to give a gap 0.0019 inch (0.05mm) to 0.0098 inch (0.25mm) max. Shims must be fitted to the front of the beam and thrust washer to the rear.
2. Ensure that the two hair pins are securely in place on the pivot retaining pin.
3. Re-adjust the toe-in and tighten the tie rod bolts to a torque of 37 lbf.ft. (50 Nm).
4. Tighten bolts and nuts securing front axle arm assemblies into the center beam to a torque of 150 lbf.ft. (205 Nm) with the wheels on the ground.

7A.7 FRONT SUPPORT

Removal and Refitment

Special Tools

SER / S / 230 : Pivot pin remover

SER / 054 : Tractor splitting stand.

Removal sequence

1. Remove the front end weights and frame.
2. Disconnect the headlight wire connections and remove the one piece hood or bonnet assembly.
3. Drain radiator water and remove the top and bottom hose. Also remove air cleaner hose.
4. Remove the radiator assembly.
5. Support the tractor under the engine sump.
6. Disconnect the remote grease hoses.
7. Support the center beam to prevent it from rolling over after removal of the pivot pin.
8. Using the SER / S / 230 withdraw the center beam pivot pin.
9. Lift the center beam carefully complete with arm assemblies and wheels using a crane.
10. Support the front support casting suitably to prevent if from falling down.
11. Remove all bolts and nuts securing the front support casting to the engine.
12. Lift out the front support casting.
13. Remove the spacer and shims from the right top stud in the engine.

WARNING : The front support casting is very heavy, so care should be taken in handling it.

Re-fitment

For re-fitment, follow the reverse procedure given above, and

1. Shims are to be fitted in between the top spacer and the front support casting on the right hand side to give 0.0051 inch (0.13mm) slack pre-load.
2. Tighten all bolts and nuts to a torque of 207 lbf. ft. (280 Nm) except the stud with the spacer.

Overhaul

Special Tools

SER / 45 : Pusher

SER / 014 : Inner bearing cup replacer

SER / 012 : Outer bearing cup replacer

SER / 147 : Hub oil seal replacer

SER / 082 : Front wheel hub remover

SER / S/ 230: Pivot pin remover

Dis-assembly

1. Remove front support casting.
2. Remove the two bushes from front support casting.

Re-assembly

For re-assembly, follow the reverse procedure given above, and

1. Use SER / 45 to re-fit the bushes and ensure the grease holes in bushes are aligning with the hole in the front casting support.
2. If gap between center beam and support casting exceeds 0.0098 inch (0.25mm) suitable shims to be added in between the center beam and support casting to give a gap 0.0019 inch (0.05mm) to 0.0098 inch (0.25mm) max. Shims must be fitted to the front of the beam and thrust washer to the rear.

Note : *Please refer Special Tool Guide for usage procedure of the above special tools.*